Installation Instructions
for use by heating contractor

VIESMANN

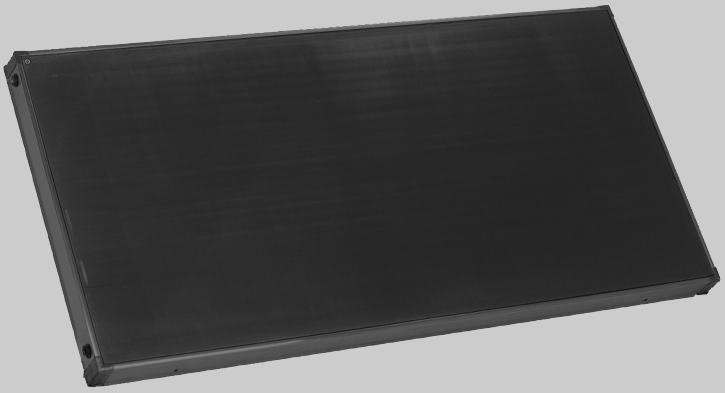
Vitosol-F
Models SV, SH
Flat plate solar collectors for sloped roofs, flat roofs and freestanding installation

Please file in Service Binder

VITOSOL-F

Vitosol 100-F
Model SV1

Vitosol 200-F
Model SV2



Vitosol 100-F
Model SH1

Vitosol 200-F
Model SH2

IMPORTANT

Read and save these instructions for future reference.

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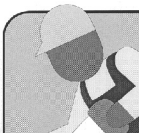
Safety, Installation and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual can cause **product/property damage**, **severe personal injury**, and/or **loss of life**. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

■ **Licensed professional heating contractor**
The installation, adjustment, service, and maintenance of this equipment *must be* performed by a licensed professional heating contractor.

► *Please see section entitled "Important Regulatory and Installation Requirements".*



■ **Product documentation**
Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

► *For a listing of applicable literature, please see section entitled "Important Regulatory and Safety Requirements".*

■ **Advice to owner**
Once the installation work is complete, the heating contractor must familiarize the system operator/ultimate owner with all equipment, as well as safety precautions/requirements, shut-down procedure, and the need for professional service annually.

■ **Warranty**
Information contained in this and related product documentation must be read and followed. *Failure to do so renders warranty null and void.*

■ **Grounding/Lightning protection of the solar system**
In the lower part of the building, install an electrical conductor on the piping system of the solar circuit in compliance with local regulations. Connection of the solar system to a new or existing lightning protection or the provision of local grounding should only be carried out by a licensed professional, who must take into account the prevailing conditions on site.

⚠ CAUTION

Observe maximum load and distance from edge before installing the substructure to the roof. If necessary, consult with a structural engineer to determine if the structure is suitable for installing solar collectors. The collectors must be securely mounted so that the mountings can withstand intense wind conditions and local snow loads.

⚠ CAUTION

Gloves and eye protection must be worn when handling solar panels.

⚠ CAUTION

Solar panel connection pipes and solar heating fluid can become hot enough to cause severe burns. Extreme caution must be taken if panels have been in a stagnant condition (no flow of fluid).

⚠ CAUTION

Avoid scratching or sudden shocks to glass cover of the solar panel.

⚠ CAUTION

Never step on collectors or solder in close proximity to the glass surface of the solar panel.

■ **Applicability**
Vitosol solar collectors are designed for use in closed loop heating systems for domestic hot water heating, space heating and pool heating via a heat exchanger. The use of Viessmann heat transfer medium "Tyfocor-HTL" is strongly recommended.

IMPORTANT

Pool water or potable water cannot be pumped directly through the Vitosol collectors. Damage to collectors caused by corrosion or scaling will void warranty.

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Important Regulatory and Installation Requirements

Codes
The installation of solar heating systems might be governed by individual local rules and regulations for this type of product, which must be observed. The installation of this unit shall be in accordance with local codes. Always use latest editions of codes.

Mechanical room
Ensure the mechanical room complies with the requirements of the system design guideline and/or technical data manual.
The solar storage tank must be installed in a mechanical room which is never subject to freezing temperatures.
If not in use and danger of freezing exists in the mechanical room, ensure water in tank is drained.

Working on the equipment
The installation, adjustment, service, and maintenance of this equipment must be done by a **licensed professional heating contractor** who is qualified and experienced in the installation, service, and maintenance of solar heating systems. There are no user serviceable parts on this equipment.

Ensure **main power** supply to equipment, the heating system, and all external controls has been **deactivated**. Take precautions in both instances to avoid accidental activation of power during service work.

Technical literature
Literature applicable to all aspects of the Vitosol:
- Technical Data Manual
- Installation Instructions
- Start-up/Service Instructions
- Operating Instructions and User's Information Manual
- System Design Guidelines

⚠ CAUTION

Carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed.

This product must be installed observing not only the necessary product literature (see list), but also all local provincial/state plumbing and building codes, as they apply to this product and all periphery equipment.

For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product.

We offer frequent installation and service seminars to familiarize our partners with our products. Please inquire.

→ *The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. These include pumps, valves, air vents, thermostats, temperature and pressure relief valves, etc.*

→ *Leave all literature at the installation site and advise the system operator/ultimate owner where the literature can be found. Contact Viessmann for additional copies.*

About these Instructions

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in substantial product/property damage, serious injury or loss of life.

→ *Warnings draw your attention to the presence of potential hazards or important product information.*

CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/property damage.

→ *Cautions draw your attention to the presence of potential hazards or important product information.*

IMPORTANT

→ *Helpful hints for installation, operation or maintenance which pertain to the product.*

→

→ *This symbol indicates that additional, pertinent information is to be found in the adjacent column.*

→ *This symbol indicates that other instructions must be referenced.*

Product Information

Please refer to the Vitosol 100-F and Vitosol 200-F Technical Data Manuals, Part No. 5354 729 and Part No. 5285 622 for complete technical information and product description.
The Technical Data Manuals are available for download at www.viessmann.ca or www.viessmann-us.com.

Vitosol 100-F, Models SV1, SH1
Vitosol 200-F, Models SV2, SH2
Flat plate solar collector

Absorber area	25 ft.^{2} / 2.3 m^2
Max. stagnation temperature	430 °F / 221 °C
Max. operating pressure	87 psig / 6 bar

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Notes on Installation

- The entire solar heating system should be installed in accordance with the accepted rules of technology, observing all relevant accident prevention regulations.
- Employ suitable safety measures to prevent falls, falling objects and roof damage due to insufficient load bearing capacity, e.g. by means of scaffolding, ladders, cable ties etc.
- The collectors must be securely mounted so that the mountings can withstand intense wind conditions.

CAUTION

Use only Viessmann supplied mounting clips and mounting hardware. Never drill or screw directly into collector side frames.

- Use only stainless steel screws and bolts when fastening mounting brackets or frames.
- Although the glass collectors surfaces are hail-proof, Viessmann recomends users to include storm coverage in their building insurance. Our warranty does not cover storm related damage.
- The collectors should, as far as possible, be oriented towards the south. Solar system performance drops off significantly if collectors face more than 50° off south.
- The collectors should be mounted level, or with a slight ascending slope (approx. ½" / 10mm) towards the high point of the piping, so that complete venting is assured.
- An air vent valve (c/w shut-off valve) should be installed at the highest point of the solar heating system.
- Filling the solar heating system with Viessmann heat transfer fluid "Tyfocor-HTL" is highly recommended. Tyfocor-HTL is supplied pre-mixed and water must **not** be added.
  Other heat transfer fluids may be suitable if they have the same temperature range (-35°C to 170°C) and are non-toxic.

CAUTION

Pool water or potable water cannot be pumped directly through the Vitosol collectors. Damage to collectors caused by corrosion, freeze damage, or scaling will void warranty.

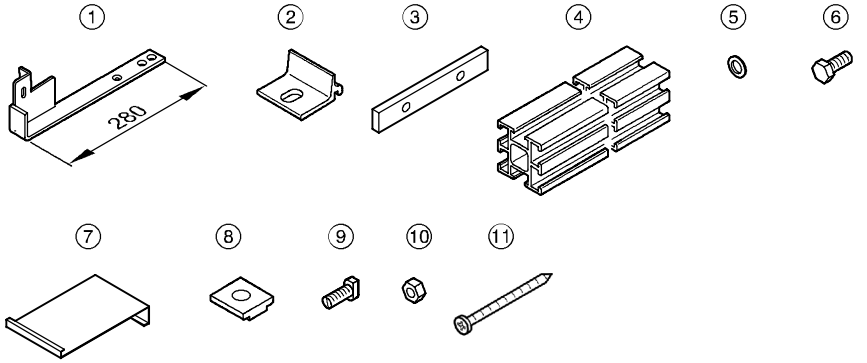
- The piping inside and outside the building should be insulated to avoid heat loss. Use only high temperature resistant pipe insulation.

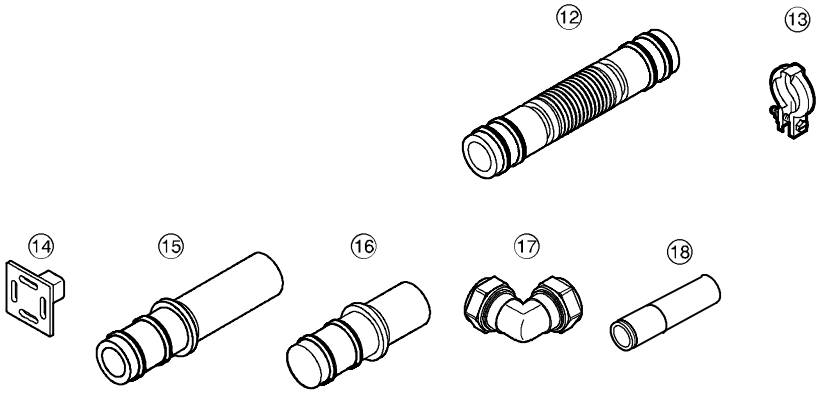
Collector Location

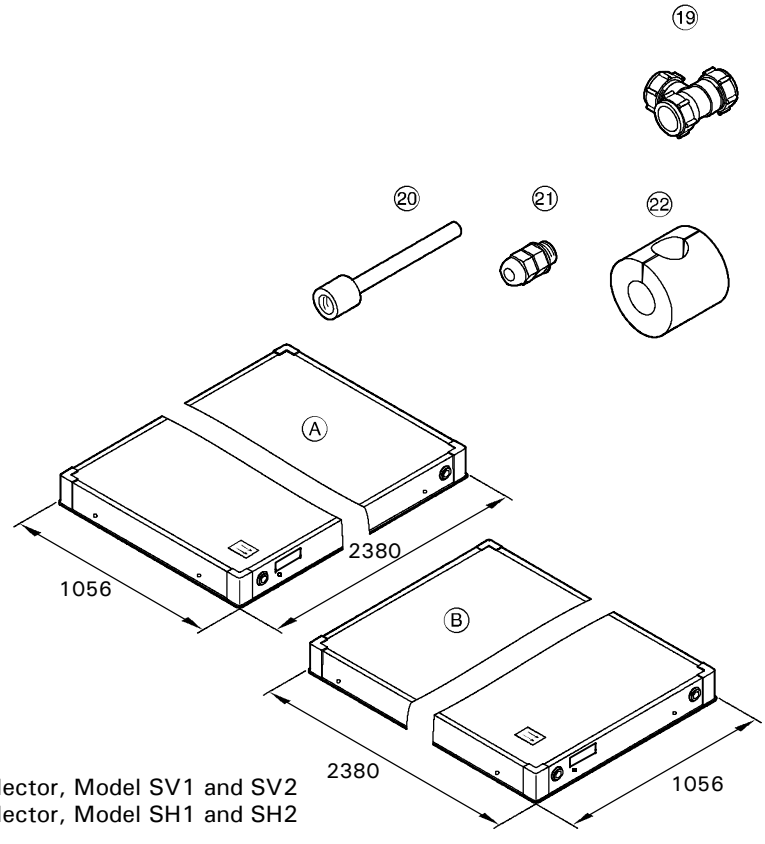
Please refer to the Vitosol System Design Guidelines, Part No. 5167 156 for detailed information on the optimum alignment and inclination of solar collectors.

Optimum alignment and inclination
The solar collector provides the highest solar yield over an annual average when facing south with an inclination of approx. 30 to 45 degrees
to the horizontal plane. However, the installation of a solar heating system is still viable even when the installation deviates quite significantly from the above (south-westerly to south-easterly alignment, 25 to 55 degrees inclination).

Overview of System Components







Ⓐ Collector, Model SV1 and SV2
Ⓑ Collector, Model SH1 and SH2

Sloped roof mounting hardware

① Roof bracket
② Clamping bracket
③ Joining element for mounting rail
④ Mounting rail, 46¼" / 1175 mm or 91¾" / 2330 mm
⑤ Washer, Ø ¼" / 8.4 mm
⑥ Hexagon screw, M 8 x 10
⑦ Mounting plate
⑧ Clamping bracket
⑨ Locking bolt w/ threaded stud
⑩ Hexagon nut
⑪ Zinc plated countersunk screws, 3.1" / 80 mm

Hydraulic connection accessories *for one panel array*

⑫ Interconnection pipes (7248 239)

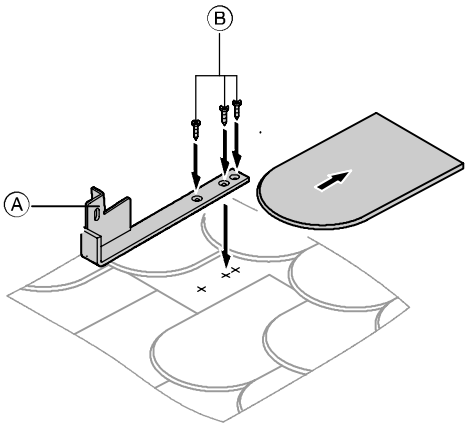
General Connection Set (7248 240) consists of:
⑬ Pipe clip
⑭ Mounting rail end cap
⑮ Connecting pipe
⑯ Plugs
⑰ Compression fitting (elbow), Ø ¾" / 22 mm, 90°
⑱ ¾" x 4" copper adaptor (part of installation fitting set 7134 449)

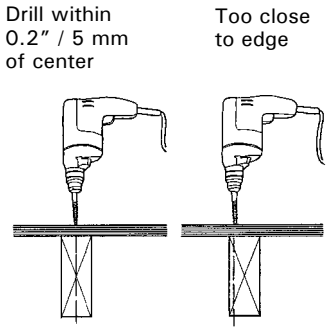
Accessories for one solar heating system

Sensor Well Set (7174 993) consists of:
⑲ Compression fitting (tee), Ø ¾" / 22 mm
⑳ Sensor well
㉑ Strain relief fitting
㉒ Insulation

Installing the Mounting Frames

Install the panel array level or slightly inclined (approximately ½" / 10 mm) towards the connection side to ensure complete venting. Always locate an air vent at the highest point in the piping.





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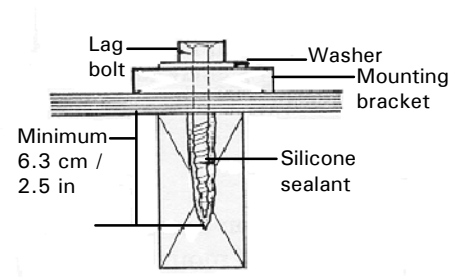


Source: CANSIA

Attaching roof brackets on shingled roof

1. The roof brackets Ⓐ should be laid out as close as possible to the dimensions shown in the chart on page 10 for SV collectors, and page 11 for SH collectors.
2. Locate the roof joist by tapping along the roof to find its general location (stud finders do not work well through shingles and roof sheathing).
3. Pry up the shingles and drill small pilot holes to locate exact location of roof joist. If necessary, check where pilot hole is coming through roof from inside of attic.
4. Drill pilot holes into center of joist as shown. Fill the pilot holes and coat the bottom of roof bracket with silicone sealant.
5. Attach bracket to roof joist using appropriate stainless steel lag bolts Ⓑ or screws (field supplied). Lag bolt should penetrate the roof joist at least 2½" / 64 mm.

CAUTION

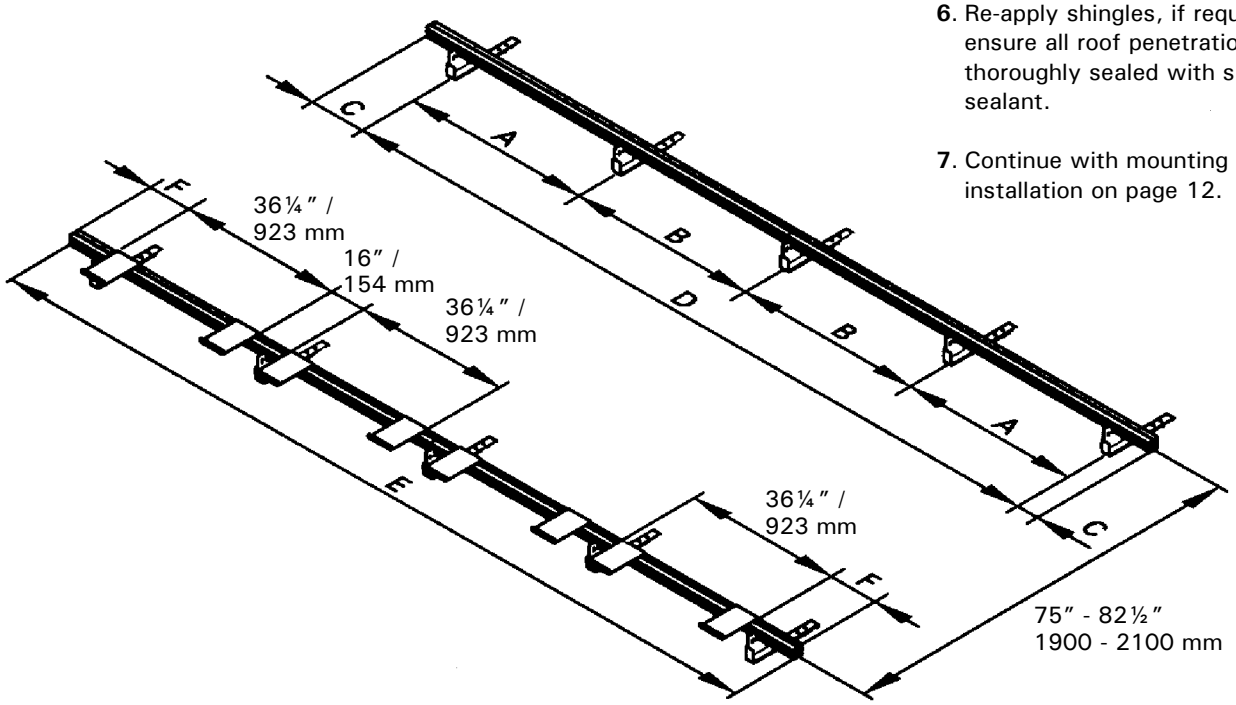
The roof bracket must be securely attached to the roof joist of the structure. Only use stainless steel attachment screws.

CAUTION

The 3.1" / 80 mm screws supplied with the mounting kit may not be sufficient length for some roof structures. The installer must ensure screws will penetrate roof joist sufficiently, and if not, must provide longer screws or lag bolts.

Installing the Mounting Frames *(continued)*

Installation dimensions for ten SV collector panels



6. Re-apply shingles, if required, and ensure all roof penetrations are thoroughly sealed with silicone sealant.

7. Continue with mounting rail installation on page 12.

Dimensions for Model SV collectors

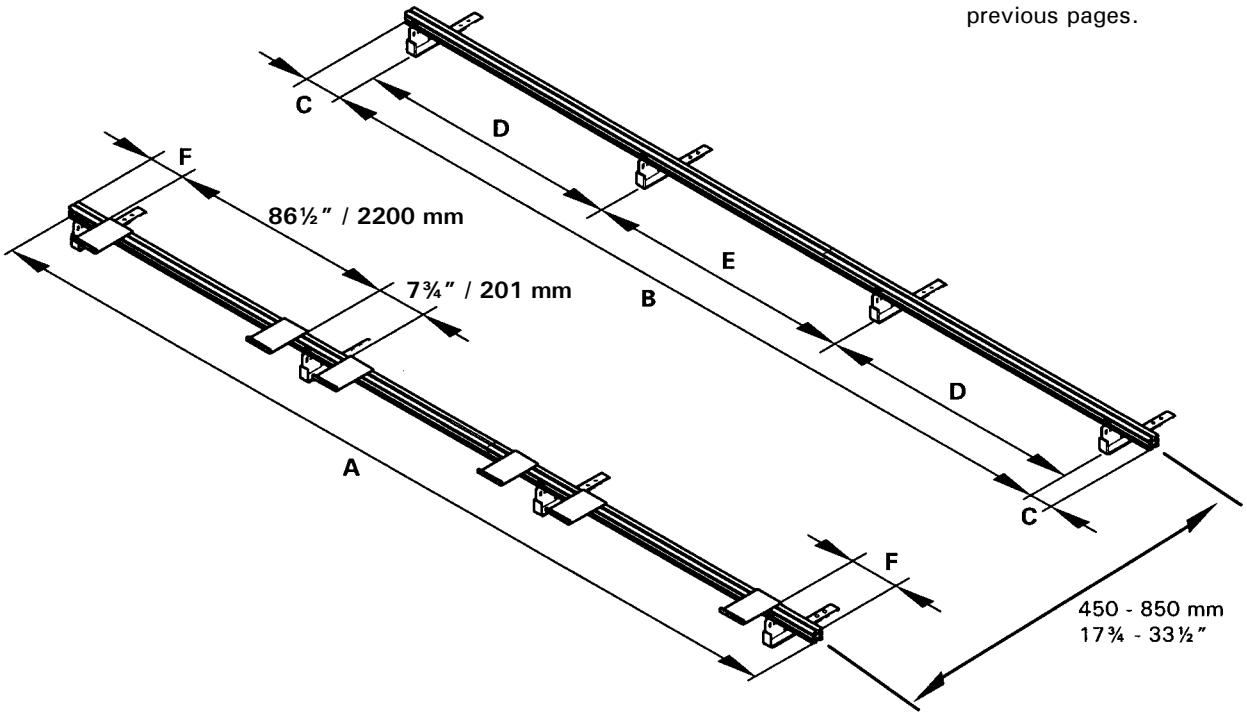
Number		1	2	3	4	5	6	8	10
Dim. A	mm	1019	1019	1019	1019	1019	1019	1019	1019
	inches	40	40	40	40	40	40	40	40
Dim. B	mm	—	—	1077	1077	1077	1077	1077	1077
	inches			42½	42½	42½	42½	42½	42½
Dim. C	mm	39.5	68.5	79	79	89.5	89.5	100	110
	inches	1½	2¾	3	3	3¼	3½	4	4½
Dim. D[*1]	mm	1019	2038	3115	4192	5269	6346	8500	10654
	inches	40	80¼	122½	165	207½	249¾	334½	419½
		A	A + A	A + B + A	A + 2xB + A	A + 3xB + A	A + 4xB + A	A + 6xB + A	A + 8xB + A
Dim. E	mm	1098	2175	3273	4350	5448	6525	8700	10875
	inches	43¼	85½	128¾	171¼	214½	256¾	342½	428
Dim. F	mm	87.5	87.5	98	98	108.5	108.5	119	129.5
	inches	3½	3½	4	4	4¼	4¼	4¾	5

[*1] *For static reasons, maintain the stated sequence. Maintain the dimensions A and B as far as possible. Roof brackets may also be offset if you need to locate roof joist. However, always maintain the overall dimension.*

Installing the Mounting Frames *(continued)*

Installation dimensions for ten SH collector panels

8. Follow steps 1 through 7 from the previous pages.



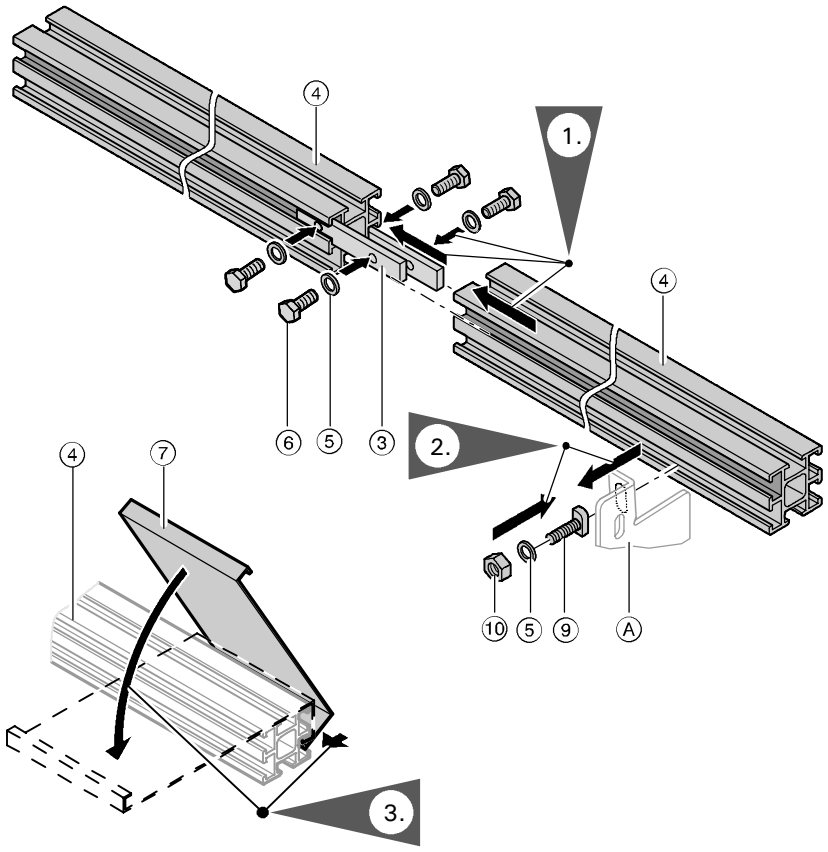
Dimensions for Model SV collectors

Number		1	2	3	4	5	6	8	10
Dim. A	mm	2422	4844	7266	9688	12110	14532	19376	24220
	inches	95¼	191	286¼	381½	476¾	572	763	953½
Dim. B	mm	2250	4500	6901	9302	11703	14104	18906	23708
	inches	88½	177	271½	366	460½	555	744½	933½
			D + D	D + E + D	D + 2xE + D	D + 3xE + D	D + 4xE + D	D + 6xE + D	D + 8xE + D
Dim. C[*1]	mm	86	172	182.5	193	203	214	235	256
	inches	3½	6¾	7¼	7½	8	8½	9¼	10
Dim. D	mm	2250	2250	2250	2250	2250	2250	2250	2250
	inches	88½	88½	88½	88½	88½	88½	88½	88½
Dim. E	mm	--	--	2401	2401	2401	2401	2401	2401
	inches			94½	94½	94½	94½	94½	94½
Dim. F	mm	111	121.5	132	142.5	153	163.5	184.5	205.5
	inches	4¼	4¾	5¼	5½	6	6½	7¼	8

[*1] *For static reasons, maintain the stated sequence. Maintain the dimensions D and E as far as possible. Roof brackets may also be offset if you need to locate roof joist. However, always maintain the overall dimension.*

Installing the Mounting Frames *(continued)*

Installing the mounting rails



Ⓐ Roof brackets

IMPORTANT

Turn the T-slot bolts 90° for all installation steps.

1. Secure the joining elements ③ into the mounting rails ④.

IMPORTANT

Make sure the mounting rail profile is as shown. Failure to install the mounting rail correctly will not allow proper mounting plate connection.

2. Secure the mounting rails to the roof bracket. The locking bolt ⑨ must be turned 90°.

IMPORTANT

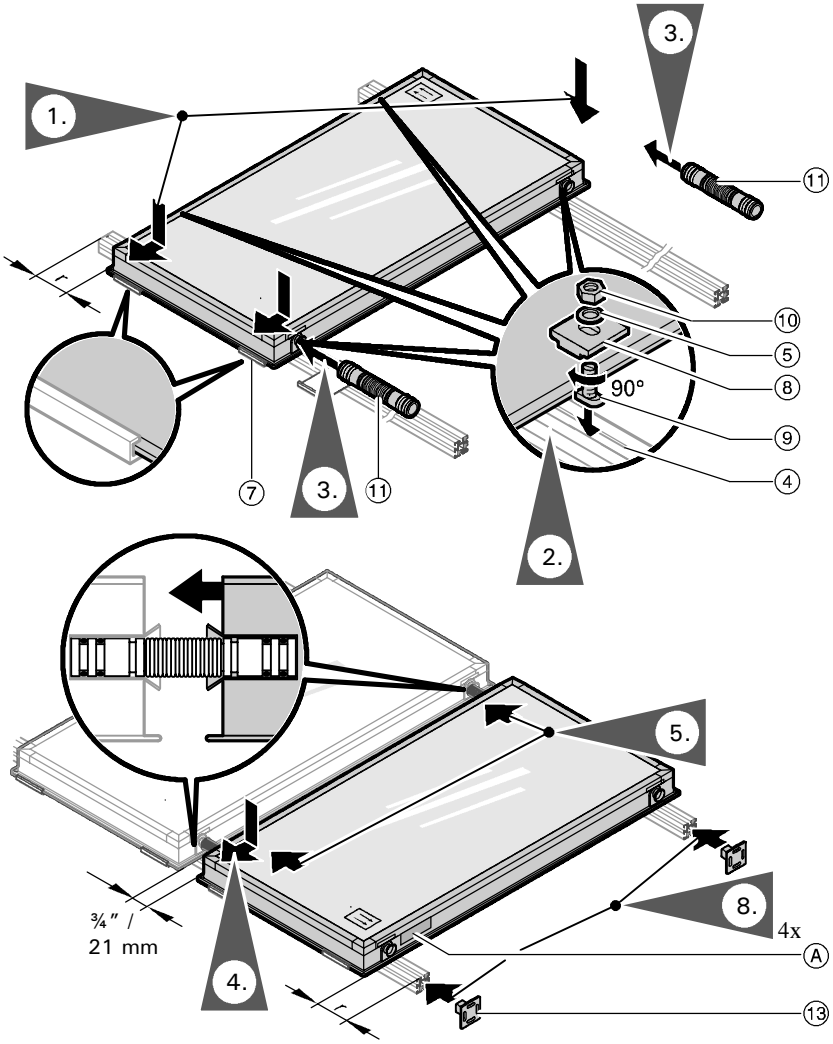
Ensure the upper and lower mounting rails are square before tightening the locking bolts. Measure from opposite corners of the top and bottom rails to ensure that array is square.

3. Hook the mounting plates ⑦ into lower mounting rails ④ according to the dimensions shown in the illustrations on pages 10 and 11.

IMPORTANT

Make sure the mounting plate is installed with the short bent edge connecting onto the bottom of the collector.

Installing the Solar Collectors



Ⓐ Rating plate
(must be on the outside of the outer collectors)

Number of collectors		1	2	3	4	5	6	8	10
Dimension r	inches	0.8	0.8	1.2	1.2	1.7	1.7	2.1	2.5
SV collector	mm	21	21	31.5	31.5	42	42	52.5	63
Dimension r	inches	0.8	1.2	1.7	2.1	2.5	2.9	3.7	4.5
SH collector	mm	21	31.5	42	52.5	63	73.5	94.5	115.5

⚠ CAUTION

Do not stand on the collectors.

IMPORTANT

Interconnecting pipes must be free from damage and contamination. Lubricate all plug-in joints (O-ring seals) on the collectors. Use only the special grease supplied with the connection set.

IMPORTANT

On the first and last collector, the side to which the rating plate is attached must be on the outside. Ensure that dimension "r" is maintained for first and last collector.

1. Hook the collector into its mounting plates ⑦ and lay down onto the mounting rails ④.
2. Secure the collector with four clamping brackets ⑧ onto the mounting rails. Tighten the two outer clamping bolts only. Turn the grooved bolt ⑨ 90°.
3. Insert the connecting pipe ⑪ until it bottoms out inside the collector connections.

IMPORTANT

Ensure interconnection pipe is centered between collector.

4. Position the second collector as in step 1.
5. Carefully push the second collector against the first and insert the connecting pipes ⑪ until they are centered between the collectors. Distance from the lower edge of the installed collector should be ¾" / 21 mm.
6. Install all additional collectors.

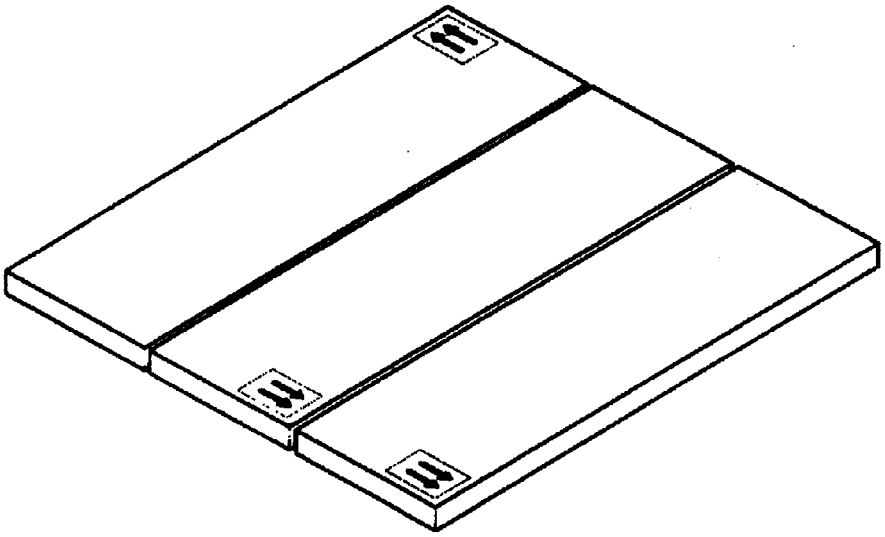
Continued on following page.

Installing the Solar Collectors *(continued)*

7. Tighten all clamping brackets.

8. Press the cover caps ⑬ (part of the connection set) into the mounting rails.

9. Remove all labels.



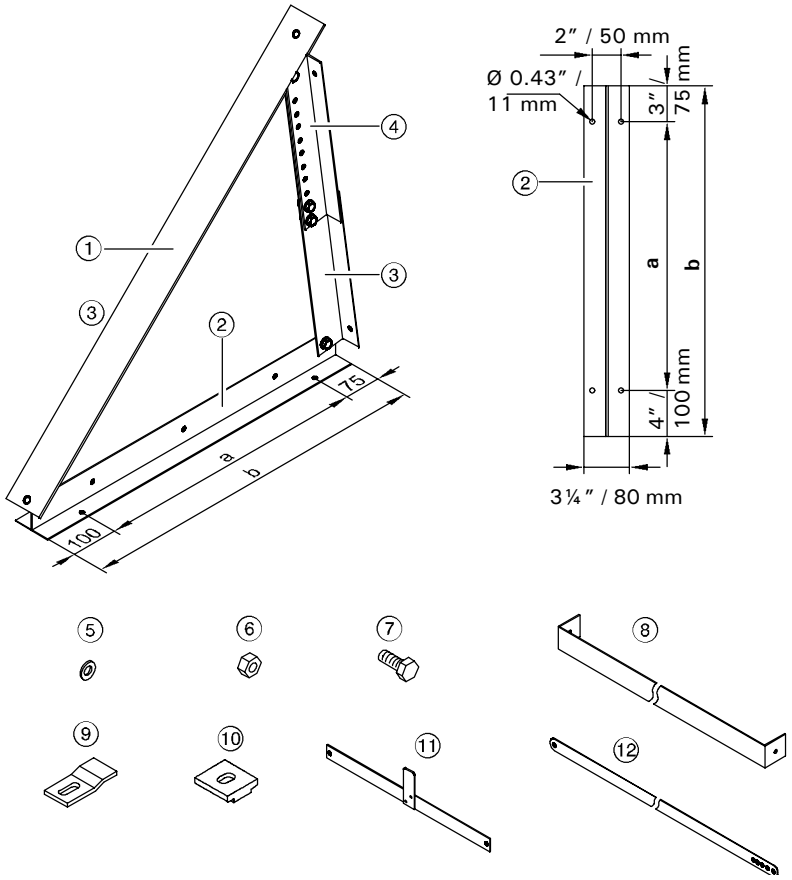
CAUTION

Arrows on the first and last collector in a series must point towards the outside.

CAUTION

Viessmann strongly recommends not removing the cover foil from the collectors until after initial start-up in order to prevent overheating.

Overview of System Components

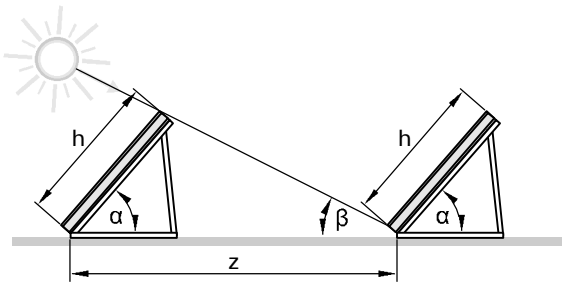


Legend:

① Collector support
② Cross brace
③ Adjustable support, lower part
④ Adjustable support, upper part (two part)
⑤ Washer, Ø 0.33″ / 8.4 mm
⑥ Hexagon nut, M8
⑦ Hexagon screw, M8 x 20
⑧ Support rail (only for flat roofs with gravel filling)
⑨ Retaining plate
⑩ Clamping bracket
⑪ Connecting brace
⑫ Connecting ties

Collector model		a	b
SV	inches	63.8	70.7
	mm	1620	1795
SH	inches	28.4	35.3
	mm	722	897

Determining the Collector Row Distance "z"



$$\frac{z}{h} = \frac{\sin(180° - (\alpha+\beta))}{\sin\beta}$$

Legend:
z = Collector row distance
h = Collector height
α = Collector angle of inclination
β = Solar angle

IMPORTANT

When installing several collectors in series, maintain a distance of "z".

Example:

Model SV
Toronto is located at approx. 43° latitude.

1. Determine the angle of the sun β. This should be chosen so that the midday sun December 21 falls on the second row of collectors without being obstructed by shadows.

Solar angle β:
β=90 °-23.5°-latitude
(23.5° should be accepted as constant value for northern latitudes)

β=90 °-23.5°-43° = 23.5°

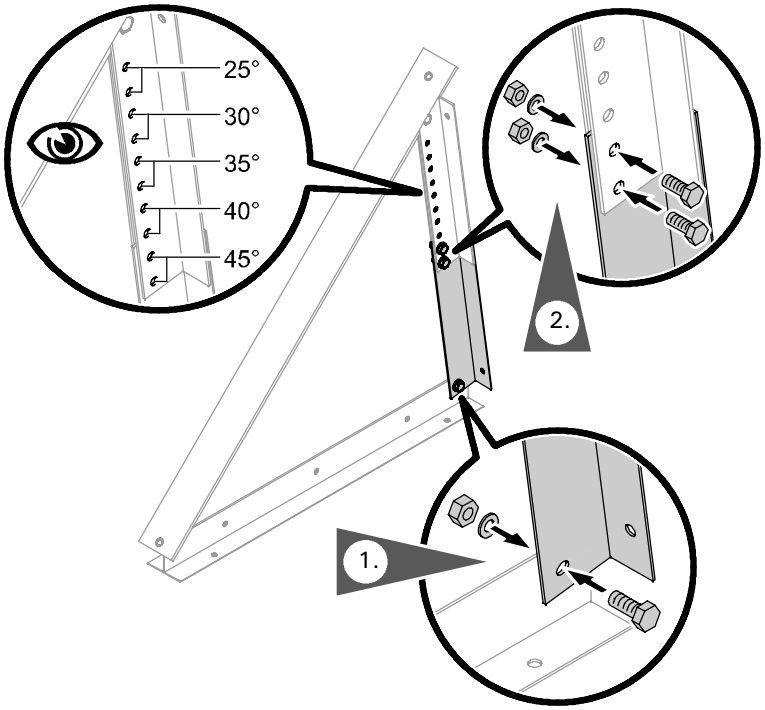
2. Calculating dimension "z":
h = 2380 mm (for model SH use 1056 mm)
α = 45°
β = 23.5°

$$z = \frac{2380 \cdot \sin(180° - (45° + 23.5°))}{\sin 23.5°}$$

$$z = \frac{2380\text{mm} \cdot \sin 111.5°}{\sin 23.5°}$$

z = 5553mm / 218.6"

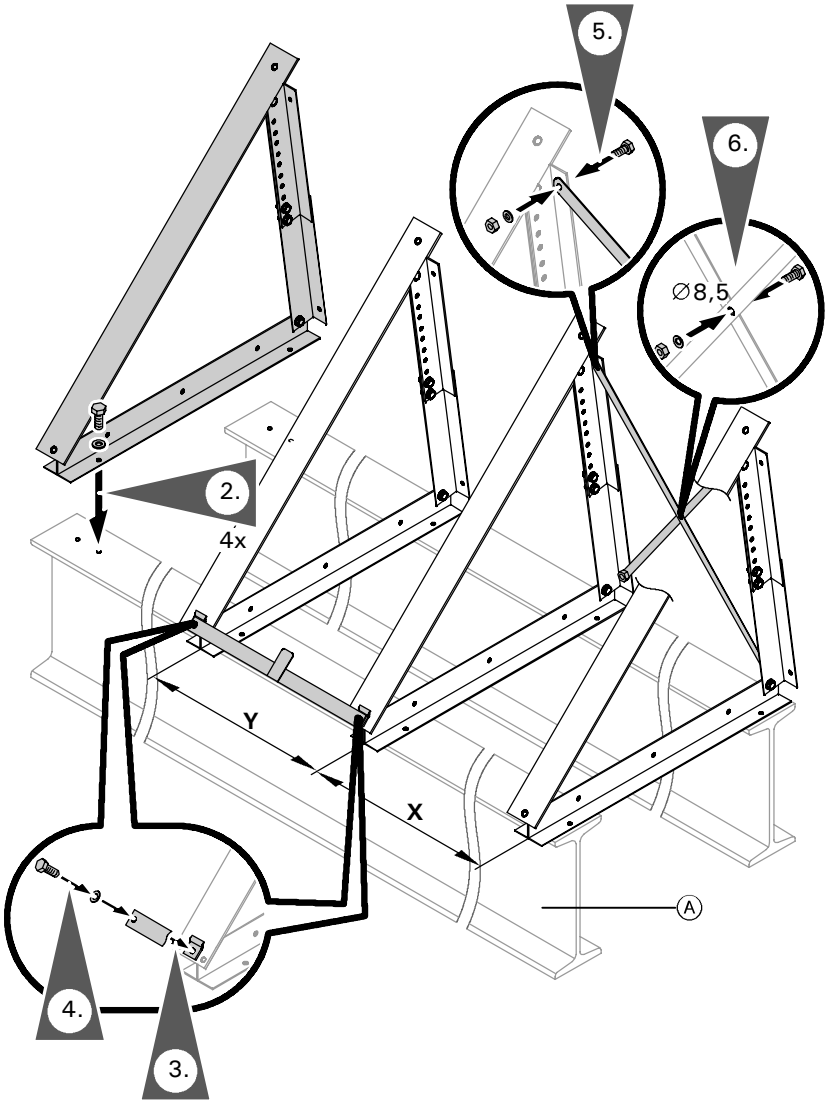
Installing the Collector Supports and Adjustment of the Angle of Inclination



1. Secure the lower adjustable support with the cross brace.

2. Secure the upper and lower adjustable supports in accordance with the required angle of inclination.

Installing Freestanding Installation (on substructures)



Ⓐ Understructure

Collector model		X	Y
SV	inches	23.5	18.9
	mm	595	481
SH	inches	75.6	18.9
	mm	1920	481

1. Mount the understructure (to be provided on site), e.g. U-channels, at right angles to and level with the installation orientation of the collectors according to the dimensions shown in the drawing.

2. Position and align the collector support frames according to the dimensions shown in the drawing and secure them to the understructure using stainless steel bolts (supplied by others). Use mounting plates as templates for drilling holes.

CAUTION

Any welds or connections to the existing substructure must be supervised by a professional structural engineer.

3. Secure retaining plates ⑨ to the bottom of all collector supports; do not tighten screws yet.

4. Secure braces ⑪ onto the retaining plates between the second and third, the fourth and fifth supports etc. Tighten all screws.

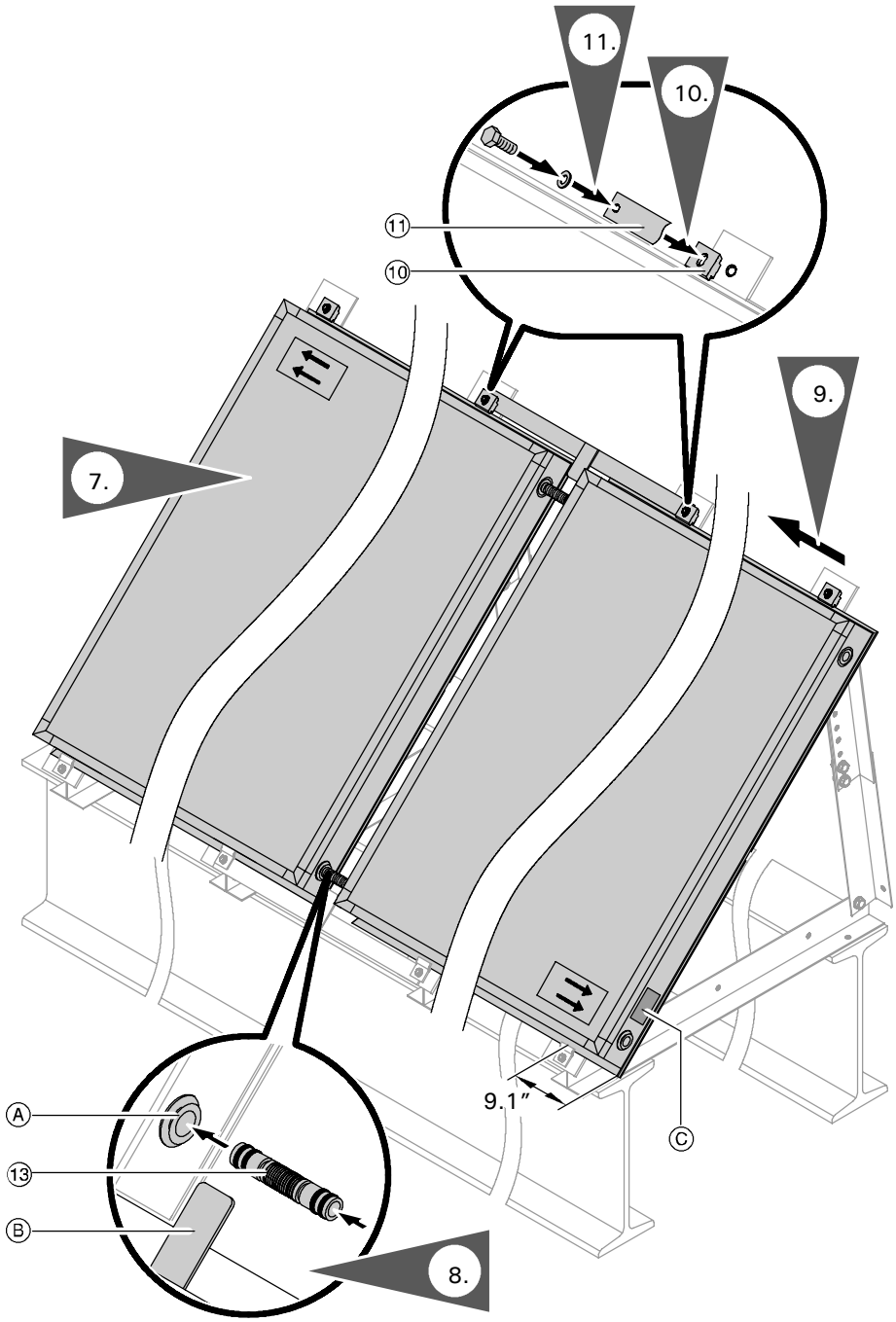
5. Secure two connecting ties ⑫ diagonally side by side to the adjustable supports, respectively for between one and six collectors.

   Note:
   Only one connecting tie is supplied for 1 to 6 collectors, two connecting ties for 7 to 10 collectors.

6. For added stability, attach connecting ties to each other where they intersect, using field supplied screw or bolt.

Continued on following page.

Installing Freestanding Installation (on substructures)



Legend

Ⓐ Collector connection
Ⓑ Spacer lip of the connecting brace
Ⓒ Rating plate

7. Position the first collector into the retaining plates and push right up to the spacer lip of the connecting brace.

IMPORTANT

Install the collector panel so that the rating plate side of the first and last collector is on the outside (note sticker)! If only one collector is to be installed, connect the piping opposite the nameplate side.

8. Insert the interconnecting pipes as far as possible into the collector connections.

IMPORTANT

Interconnecting pipes must be free from damage and contamination. Lubricate all plug-in joints (O-ring seals) on the collectors. Use only the special grease supplied with the connection set.

9. Carefully push the next collector up to the spacer lip and insert the interconnecting pipes as far as possible.

IMPORTANT

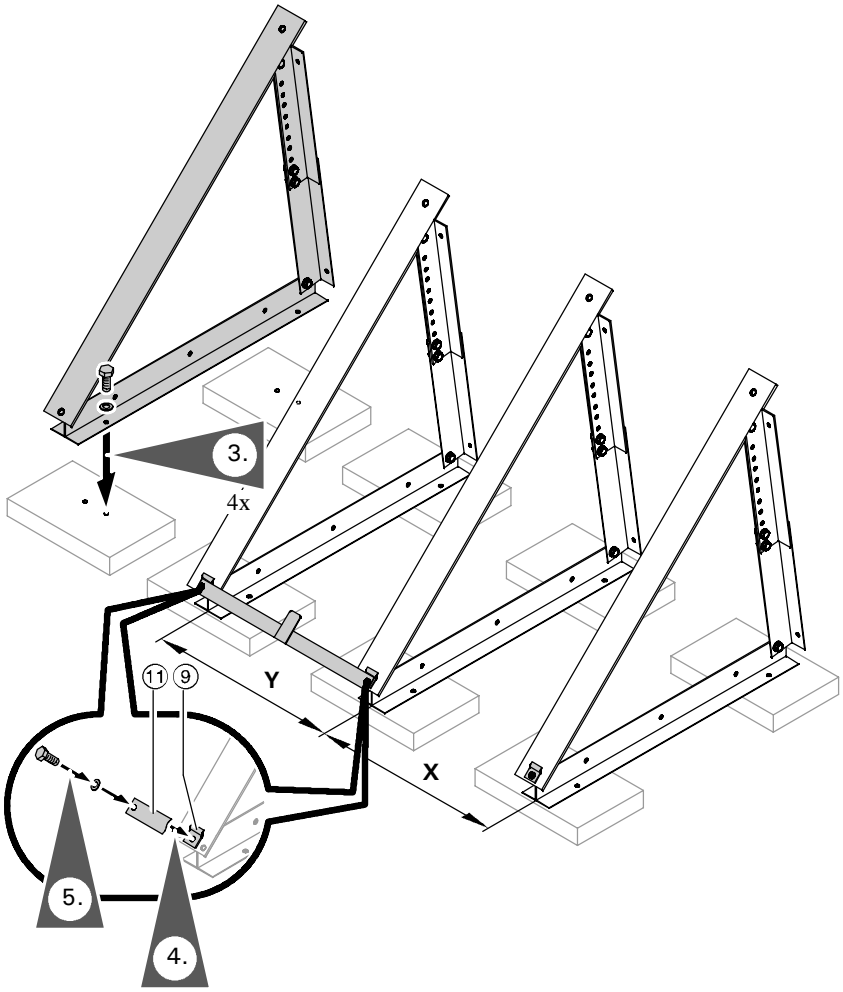
Ensure interconnection pipe is centered between collectors.

10. Click clamping brackets ⑩ into the collector edge at the **top** of all supports.

11. Secure the connecting brace turned by 180° to the next brace using the clamping brackets between the second and third, the fourth and fifth supports, etc.

12. Tighten all screws.

Installing a Freestanding Installation (with weight inserts)



Collector model		X	Y
SV	inches	23.5	18.9
	mm	595	481
SH	inches	75.6	18.9
	mm	1920	481

1. Observe the max. load and distance from the edge of the roof for on-site substructure.

CAUTION

A structural engineer must be consulted to ensure that the existing roof structure is capable of carrying the additional weight of the collectors, insert weights and support slabs.

2. Remove any gravel etc. from the installation area, cover the surface with protective building mats or foam insulation and position concrete slabs on top of the mats or insulation.

3. Secure the support cross brace (use as drilling template) onto the concrete slabs (bolts supplied by others).

4. Secure retaining plates ⑨ to the **bottom** of all collector supports; do not yet tighten screws.

5. Secure connecting braces ⑪ onto the retaining plates between the second and third, the fourth and fifth supports etc.
Tighten all screws.

Continued on following page.

Installing Freestanding Installation (with weight inserts)

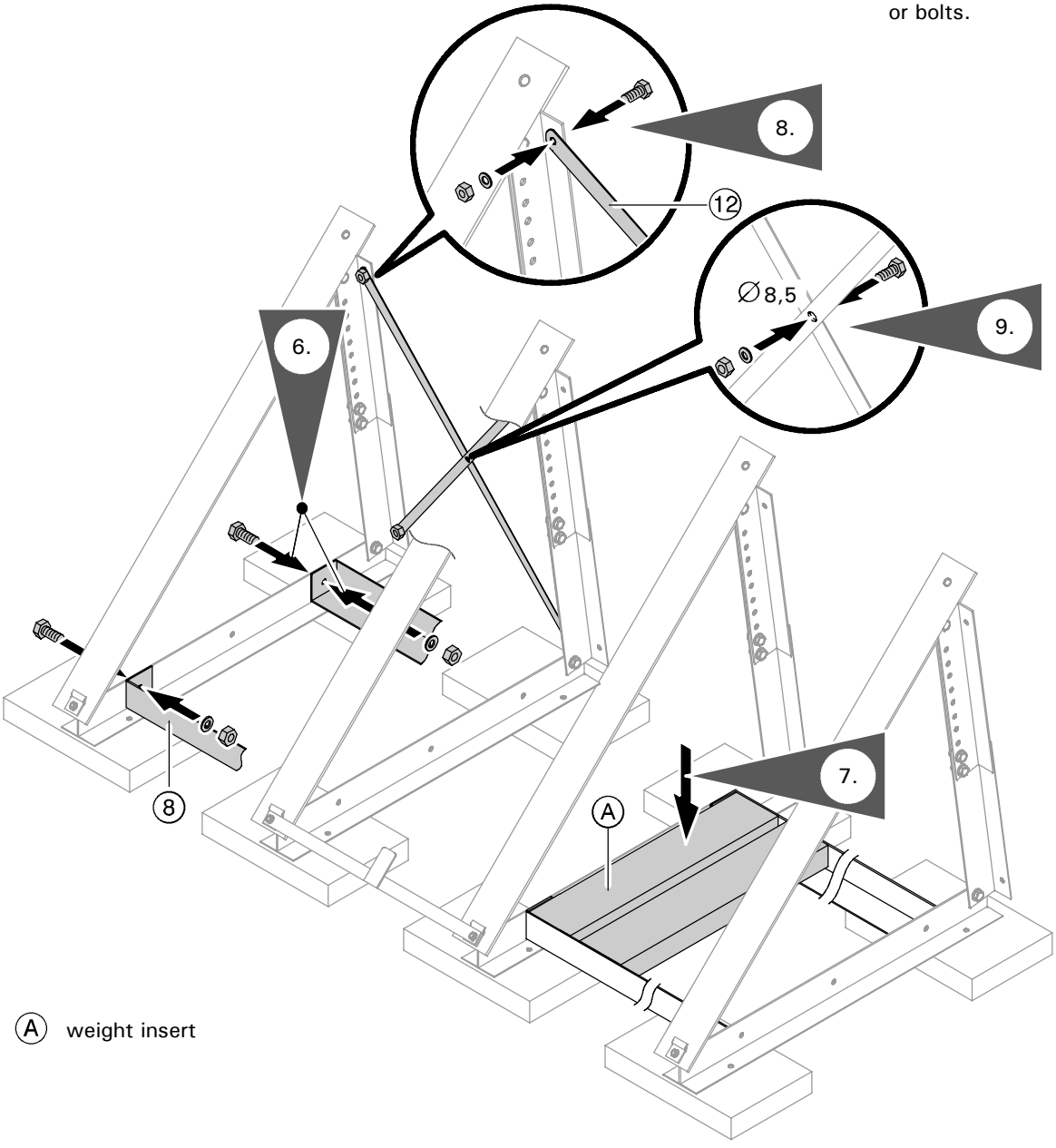
6. Secure the support rails between the cross braces.

Note:
With an angle of inclination of 25 and 30°, the front support rails can be secured in the center.

7. Apply weights (see tables on page 23).

8. Secure two connecting ties diagonally side by side to the adjustable supports (for up to six collectors).

9. For added stability, attach connecting ties to each other where they intersect, using field supplied screws or bolts.



Ⓐ weight insert

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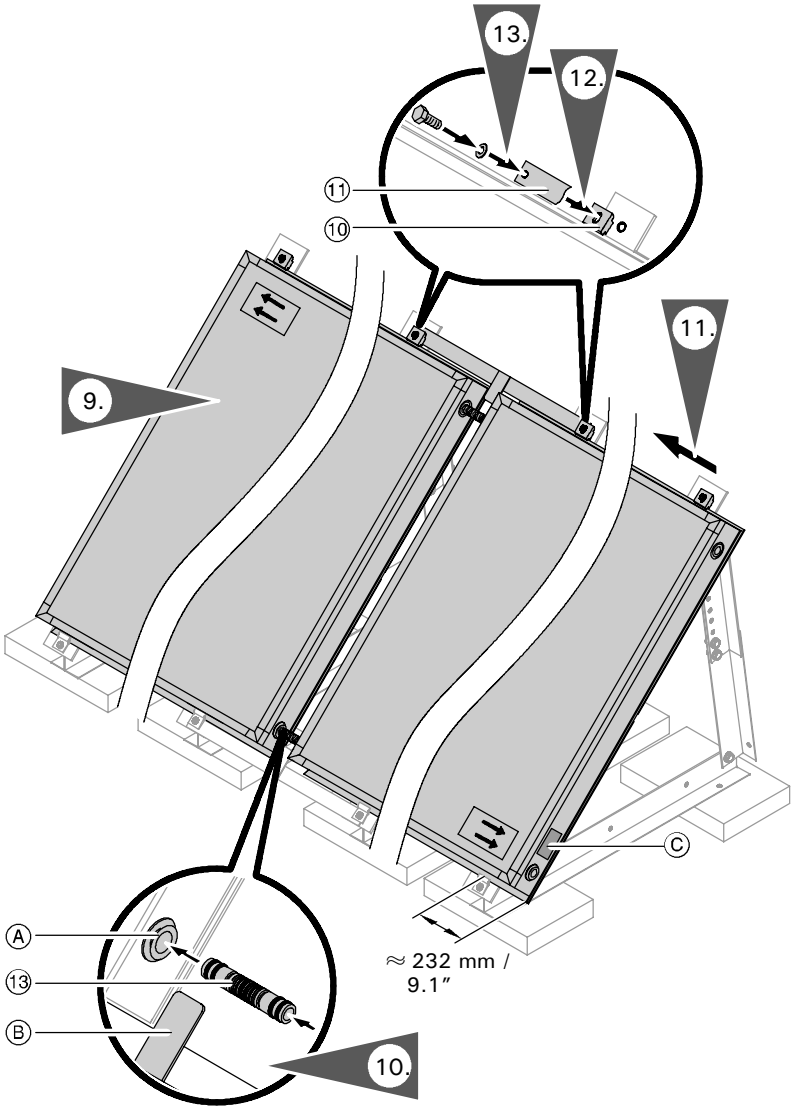
Installing Freestanding Installation (with weight inserts)



Ⓐ Collector connection
Ⓑ Spacer lip
Ⓒ Rating plate

9. Position the first collector into the retaining plates and push right up to the spacer lip of the connecting brace.
Center the distance when fitting only a single collector.

IMPORTANT

Install the collector panel so that the rating plate side of the first and last collector is on the outside (note sticker)! If only one collector is to be installed, connect the piping opposite the nameplate side.

10. Insert the interconnecting pipes ⑬ as far as possible into the collector connections.

IMPORTANT

Interconnecting pipes must be free from damage and contamination. Lubricate all plug-in joints (O-ring seals) on the collectors. Use only the special grease supplied with the connection set.

11. Carefully push the next collector up to the spacer lip and insert the interconnecting pipes as far as possible.

IMPORTANT

Ensure interconnection pipe is centered between collectors.

12. Click clamping brackets ⑩ into the collector edge at the **top** of all supports.

13. Secure the connecting brace ⑪ turned by 180° to the next brace using the clamping brackets between the second and third, the fourth and fifth supports, etc.

14. Tighten all screws.

Installing Freestanding Installation (with weight inserts)

Model SV		Secure against slipping*1			Secure against lifting*2		
Installation height above ground level	ft.	< 26	26 - 66	66 - 328	< 26	26 - 66	66 - 328
	m	< 8	8 - 20	20 - 100	< 8	8 - 20	20 - 100
Required weight at 25°	lbs*3	694	1221	1748	317	670	1025
	kg	315	554	793	144	304	465
Required weight at 45°	lbs	1120	1856	2674	282	493	762
	kg	508	842	1213	128	224	346

*1 *Securing against slipping requires no additional attachment to roof.*
*2 *Securing against lifting requires additional attachment to roof or structure with wires or cables.*
*3 *Weights listed are the total of the insert weights and support slabs.*

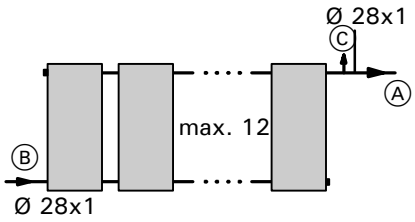
Model SH		Secure against slipping*1			Secure against lifting*2		
Installation height above ground level	ft.	**< 26**	**26 - 66**	**100 < 26**	**66 - 328**	**26 - 66**	**66 - 328**
	m	**< 8**	**8 - 20**	**< 8**	**20 -**	**8 - 20**	**20 - 100**
Required weight at 25°	lbs*3	712	1237	1764	342	695	1049
	kg	323	561	800	155	315	476
Required weight at 45°	lbs	1085	1863	2641	291	560	827
	kg	492	845	1198	132	254	375

*1 *Securing against slipping requires no additional attachment to roof.*
*2 *Securing against lifting requires additional attachment to roof or structure with wires or cables.*
*3 *Weights listed are the total of the insert weights and support slabs.*

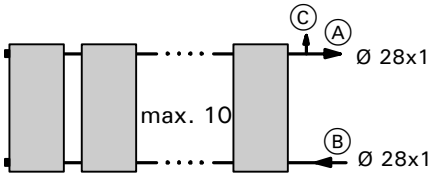
Supply and Return Piping Configuration

Vitosol 100
Models SV, SH

Installation of collectors, connection on alternate sides, **max.** 12 collectors.

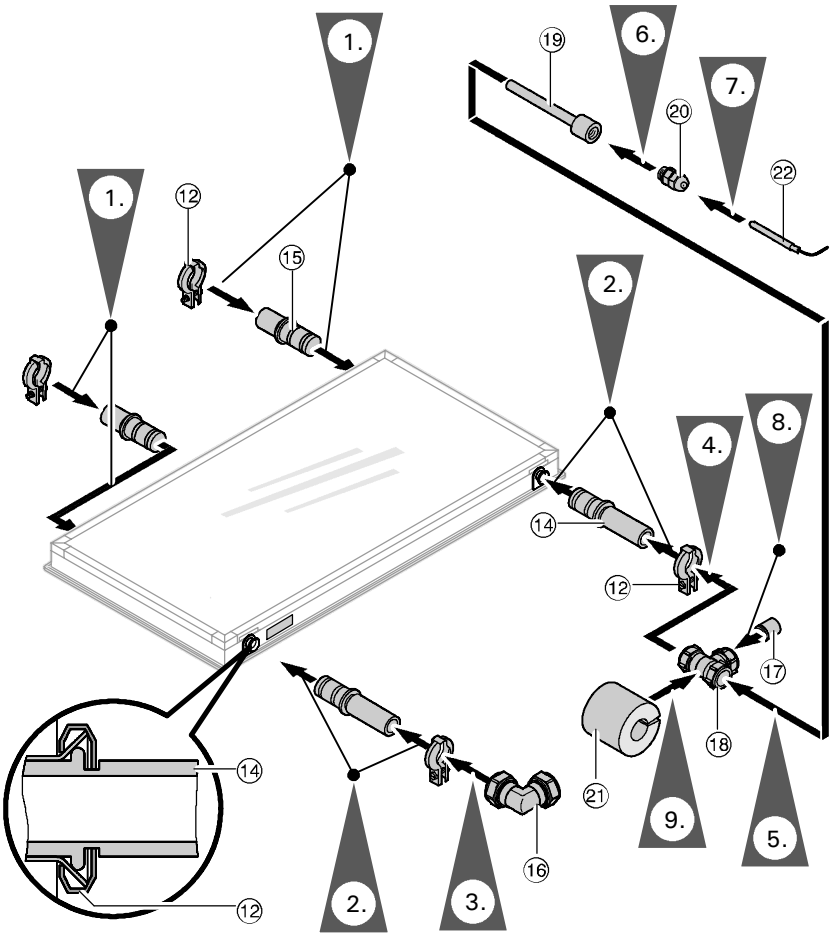


Installation of collectors, single-sided connection, **max.** 10 collectors.



Ⓐ Supply (hot)
Ⓑ Return
Ⓒ Air vent valve (shut-off type)

Installing the Connection Set and Collector Temperature Sensor



When assembling the locking ring compression fitting, observe the following:

- All pipe ends must be square and deburred.
- Push the union nut and the locking ring onto the pipe adaptor and lightly lubricate the threads with oil.
- Push the pipe into the compression fitting as far as it will go.
- Initially, turn the union nut by hand, then tighten with an open ended spanner by another ¾ turn.

Do not use annealed copper pipes with compression fittings.

1. Insert the plug ⑮ until it bottoms out, and secure with hose clip ⑫.
2. Insert the connection pipes ⑭ until they bottom out and secure them with hose clips ⑫.
3. Fit the elbow ⑯ onto the return connector at the bottom of the collector.
4. Fit the tee ⑱ onto the supply connector at the top of the collector.
5. Insert the sensor well ⑲ into the tee ⑱. Hold the tee tightly.
6. Insert the strain relief fitting ⑳ into the sensor well.
7. Insert the collector temperature sensor ㉒ (supplied with solar controller) until it bottoms out inside the sensor well, and secure with strain relief fitting.
8. Insert the 4" copper adaptor ⑰ into the compression fittings and make the connection between the panel array and the supply and return piping.
9. Install the insulation ㉑ and secure with adhesive on its cut faces.

p

Collector Supply and Return Piping

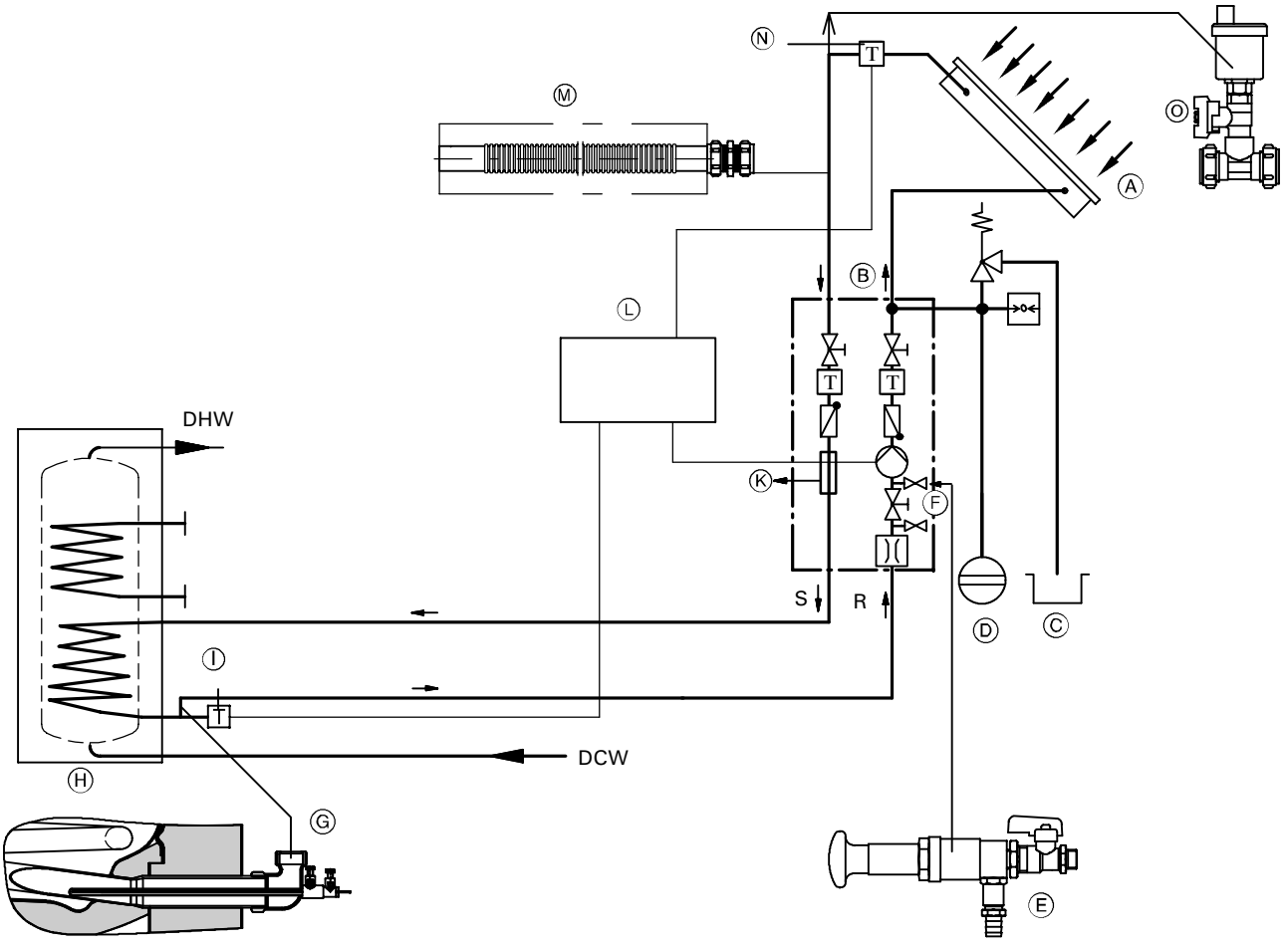
- For the piping connecting the collectors to the Solar Divicon pumping station, Viessmann recommends the use of commercial copper pipe and bronze fittings, or non-galvanized steel pipe. PEX or other plastic pipes are not suitable for solar collector supply and return piping.
- Use only high temperature solder or brazing material when connecting the copper pipes in the collector piping. The melting temperature should be above 450 °F / 232 °C.
- When laying out the collector array, ensure that the system can "breathe" properly. Do not route pipes above the collector array.

CAUTION

Do not use galvanized pipes, galvanized fittings or graphitized gaskets, or any type of plastic pipes.

Refer to the Vitosol System Design Guidelines for required flow rates and pipe sizing parameters for Vitosol-F collectors.

Sample System Layout



Ⓐ Solar collector
Ⓑ Solar-Divicon (pumping station)
Ⓒ Collecting tank
Ⓓ Expansion vessel
Ⓔ Solar manual filling pump
Ⓕ System fill manifold valve
Ⓖ Screw-in elbow, comes with sensor well
Ⓗ Dual-mode DHW tank
Ⓘ Tank temperature sensor
Ⓚ Air separator
Ⓛ Solar control unit
Ⓜ Flexible connection pipe (optional)
Ⓝ Collector temperature sensor
Ⓞ Fast air vent, c/w shutoff valve *1

R Return to collector
S Supply from collector

*1 *Install at least one air vent valve at the highest point of the system.*

Refer to the Vitosol System Design Guidelines for more information on other installation examples and system types.

WARNING

The domestic hot water temperature must be limited to 140°F / 60°C by installing a mixing device, e.g. a thermostatic anti-scald mixing valve.

System Installation

Please refer to the Vitosol "System Design Guidelines" for supplementary notes on installation examples and system types.

- The connecting lines must be pressure and temperature-resistant (observe the max. shutdown temperature of the collector).

- To guarantee the satisfactory operation of the solar heating system, install the pipes so that complete air venting is assured.

CAUTION

Use only red bronze fittings, brass fittings and copper piping.
Do not use galvanized pipes, galvanized fittings, graphitized gaskets or any type of plastic pipe.

CAUTION

Do not carry out any soldering work at or near the collector.

- At least one fast-acting air vent with shut-off valve must be installed at the highest point of the system.
  Install an air separator at an accessible point in the piping (e.g. in the flow of the solar circuit, upstream of the inlet to the indirect coil of the domestic hot water tank).

- The system must be equipped with an expansion tank, safety valve and circulation pump.

- The Solar-Divicon is equipped with a safety valve designed for max. 87 psig / 6 bar.

- Use only a diaphragm expansion tank that is suitable for the application as a solar expansion tank.

- The expansion tank must be approved for use in a solar heating system and must be connected via a heat insulating loop.
  The diaphragms and seals of the expansion tank and the safety valve must be suitable for the heat transfer medium.

Please refer to the "Service Instructions" in order to calculate the inlet pressure of the diaphragm expansion vessel.

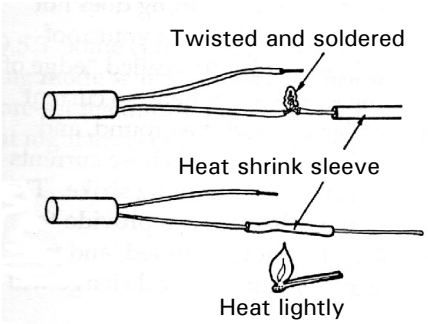
- Before filling system with solar heat transfer fluid, thoroughly flush and clean piping system to remove all dirt, oils, flux and solder residue.

- Fill the solar heating system with Viessmann heat transfer medium "Tyfocor-HTL". The "Tyfocor-HTL" is supplied as a premixed glycol/water solution and must not be mixed. The blow-off and discharge pipes must be run to an open container capable of accommodating the total capacity of the collectors.

CAUTION

Components used must be resistant to the heat transfer medium.
Insulation of external piping must be resistant to temperature*1, UV radiation and to destruction by birds (e.g. through the use of metal sheathing).

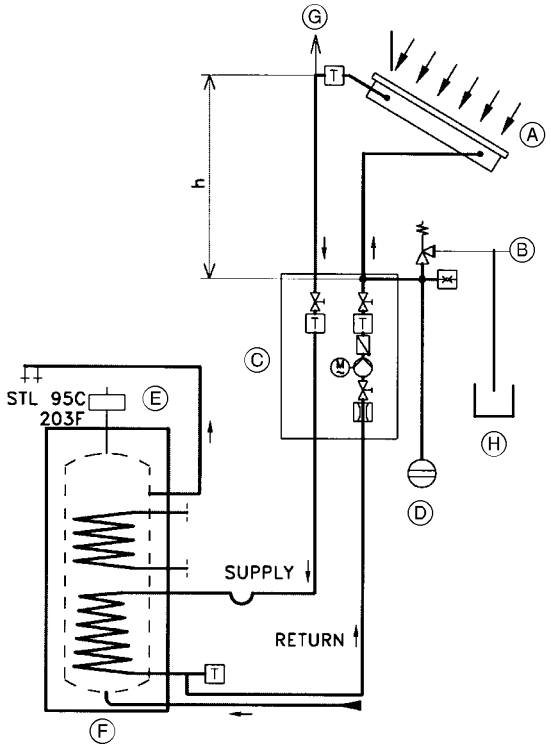
- Prior to installing pipe insulation, run a stranded and protected 18/2 AWG low voltage sensor wire from the solar controller to the collector sensor well. Ensure all wire connections are soldered and sealed with heat shrink sleeve connectors (see illustration below). Cover all wire and connections with insulation and jacket.



Source: CANSIA

*1 E.g. HT/Armaflex (temperature resistant up to 175 °C) supplied by Armstrong Insulation Products

Initial Start-up



Ⓐ Collector
Ⓑ Pressure relief valve
Ⓒ Solar-Divicon
Ⓓ Diaphragm expansion vessel
Ⓔ High-limit safety cut-out
Ⓕ DHW tank
Ⓖ Air vent c/w shut-off
Ⓗ Overflow container
T Temperature sensors

The collector circuit must be protected in such a way that at the highest possible collector temperature (shutdown temperature) no heat transfer fluid can escape from the safety valve, or the air vent.
This is achieved by the appropriate sizing of the expansion tank and matching of the system pressure.

IMPORTANT

Under cold fill conditions, a minimum static pressure must be maintained. It can be calculated by the following:
22 psig + 0.45 psig x_____h(ft.)
or
1.5 bar + 0.1 x_____h(m)

CAUTION

The pressure relief valve must be piped to the overflow container or drain at all times, since excessively hot fluid can discharge from the system.

CAUTION

After de-aeration, the air vent c/w shut-off at top of system must be closed. To protect the solar system from overheating in the summer, e.g. during the holidays, do not shut down.

Commissioning and Adjustment

For commissioning of the solar heating system, refer to the Vitosol Service and Operating Instructions.

Post-Installation

Checklist

☐ Has the solar circuit been installed in accordance with the circuit diagram and all relevant standards?

☐ Have the collectors been installed with a slight upward gradient towards the piping side?

☐ Have the supply and return connections been carried out and pressure tested?

☐ Have the electrical connections been carried out correctly?

☐ Have the sensors been installed correctly?

☐ Have air vent valves been installed at the highest points of the system and are they open?

⚠ CAUTION

It is absolutely essential to close the air vent valves again when the system has been started up and de-aerated.

☐ Have all screws, screwed pipe connections and covers been securely tightened?

☐ Has the domestic hot water tank been filled with water?

☐ Does the maximum capacity of the expansion vessel correspond to the value stated in the System Design Guidelines?

☐ Has the inlet pressure of the expansion vessel been adjusted to the system pressure?

☐ Have connecting pipes been insulated and protected from the elements?

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Technical information subject to change without notice.

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